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not see his way clear to accept Bizzozero's theory of the regeneration of the cells covering the villi, as it is the only plausible explanation of it. It does not seem to us that a shifting of the cells from the crypts to the villi necessarily proves that the crypts are not glands, for it is by no means shown that the function of the cells covering the villi is only to absorb. It may also be to secrete. The large number of goblet cells would appear to indicate this. Moreover, similar instances corroborative of Bizzozero's theory are not wanting, as, for instance, in the central nervous system and in the epidermis, and until it is proved to be incorrect it seems to us that it is well to retain the theory.

The mucosa proper is the most complex portion of the intestine, as the folds, villi, and villi upon folds, are only modifications of a simpler membrane. In the mucosa we have all of the characteristics of a lymph gland, extending from the muscularis mucosæ into the folds and villi. Between the bases of the villi and the muscularis mucosæ, the crypts, when present, are lodged. The connective-tissue frame-work of the mucosa has been shown to be composed of fibers, neither white fibrous nor yellow elastic, which are constantly anastomosing to form a reticulum identical with that of lymph nodules. Siegfried has recently shown that they are composed of a body rich in sulphur and phosphorus, which he has called 'reticulin.' Oppel gives a good discussion of this tissue and its importance. Below the crypts the lymphatic tissue is arranged in a layer known as the stratum granulosum.

Between the stratum granulosum and the muscularis mucosæ there is an additional hyaline membrane. This layer had been observed a number of times in the stomach and intestine of various animals and was isolated and discussed by Mall as the stratum fibrosum. Oppel objects to this name, as there had been a difference of opinion regarding its constitution, and substitutes for it the name stratum compactum. Since the appearance of Oppel's book, however, Spalteholz has shown conclusively that this layer is really composed of white fibrous tissue, and, therefore, the name stratum fibrosum is still appropriate. It is to be regretted that Spalteholz's paper appeared

too late to be used by Oppel, for the introduction of new terms has a tendency to add confusion to the subject.

The description of Brunner's glands, the lymphatic vessels and nodules, the blood-vessels and nerves is extensive and complete, but it is of such a nature that it cannot be given in a brief review.

The above shows the extent and some of the features of the book. It is a mine of facts arranged in such a manner that anything in it can be easily found. If the work were more critical it would be of much greater value. But as it stands it is a great addition to our literature and will be welcomed by all students of anatomy. FRANKLIN P. MALL.

Whittaker's Mechanical Engineer's Pocket-book.

By PHILIP R. BJÖRLING. London, Whittaker & Co.; New York, The Macmillan Co. 1898. 32mo. Pp. 377. Illustrations. Price, \$1.75.

This is a 'pocket-book' of the now standard form and page, and including the usual compilation of tables and data for use in the design of machinery and works of engineering. It is neatly put up and well bound, with good paper and clear type of larger size than the microscopic print often seen in such books, vexing the eye and trying the patience of the reader. The first section of the book is devoted to hydraulics and water-wheels, and is exceptionally extensive for a compilation of this size. The section on steam-engines includes modern forms, and gives the proportions of the later constructions. The empirical but standard rules of construction are given, as customarily employed by British designers, and good tables of hyperbolic logarithms and of mean pressures are added. Proportions of details of machine-construction are given very fully, no space being given up to references. The usual and always necessary numerical tables conclude the work.

R. H. T.

The Entropy-Temperature Analysis of Steam-Engine Efficiencies. Prepared by SIDNEY A. REEVE, M.E. New York, Progressive Age Co. 1897. 8vo. Pp. 20, with large folded diagram.

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